

# THE EXPOSURE EFFECT OF ORGANISMS TO NANOPARTICLES AND NANOMATERIALS: GENETIC AND EPIGENETIC MODIFICATIONS

*Gheorghita MENGHIU*<sup>(1,2)</sup>, *Vasile OSTAFE*<sup>(1,2\*)</sup>

<sup>1</sup> Advanced Environmental Research Laboratories, Oituz 4, Timisoara 300086, Romania

<sup>2</sup> West University of Timisoara, Faculty of Chemistry, Biology, Geography, Pestalozzi  
16, Timisoara 300115, Romania

## ABSTRACT

The exposure of organisms to nanoparticles and nanomaterials is increasingly used, but their effect on DNA or RNA sequences and genes function is not fully known. Recent studies show that in mammalian cells exposed to different nanoparticles as gold, silver, titanium dioxide, cerium oxide, silica, cobalt, chromium or carbon nanotubes, the DNA undergoes damaging and proteins expression is strongly influenced. Changes in DNA methylation, in DNA repair pathways or post-translational modifications of histones and noncoding RNA, were also identified. Nanomaterials obtained from chitosan, polylactic acid, poly (lactic-co-glycolic acid) or polyhydroxyalkanoate are also widely investigated for drug delivery and tissue engineering applications, but their genotoxic potential is also a challenge at cellular level.

**Keywords:** nanoparticles, nanomaterials, epigenetic modifications, DNA, RNA

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\* Correspondent author: Tel., Fax., E-mails: